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With Compliments of the Author.

.....

The Real Value of the Medicinal Peroxide of Hydrogen Pre- parations Found in the Market.

.....BY.....

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Formerly with the Health Department of New York City.



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THE REAL VALUE OF THE MEDICINAL PEROXIDE OF HYDROGEN PREPARATIONS FOUND IN THE MARKET.

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Formerly with the Health Department of New York City.

My attention having repeatedly been called to several reports and analyses made by different chemists and published by some medical journals, I concluded to examine all the brands of peroxide of hydrogen which I could find on the market, in order to ascertain the real value of each when intended to be used as an antiseptic remedy, both internally and externally.

The reports on the subject which have

come to my knowledge are quite contradictory, and my object is to impart to the medical profession the results of my experiments, which have been made on fourteen fresh samples, purchased by me in duplicate, directly from the manufacturers or their selling agents.

These brands have been tested for the volume of available oxygen, the amount of residue, the degree of acidity, and the amount of soluble baryta salts contained therein, as per following table:

BRANDS.		Volume of Available Oxygen, determined by means of a solution containing 5.665 Grammes of Potassium Permanganate of Potash per liter of distilled water.	Residue obtained from 100 G. G. of Peroxide of Hydrogen dried at 120 degrees C.	Acidity expressed in Cubic centimeters of Normal Volumetric Soda Solution for 100 G. G. of Peroxide.	Baryta found in Soluble Baryta Salts contained in 100 G. G. of Peroxide.
No. 1.	John Bene's Peroxide of Hydrogen Medicinal	10.50	0.1886	2.19	None
No. 2.	Hydrozone	27.35	0.2180	3.11	None
No. 3.	Larkin & Scheffer's Peroxide of Hydrogen Medicinal	9.65	0.1206	6.75	None
No. 4.	Mallinckrodt's Peroxide of Hydrogen Medicinal	9.55	0.1408	1.43	None
No. 5.	Marchand's Peroxide of Hydrogen Medicinal	16.55	0.564	1.29	None
No. 6.	McKesson & Robbins' Peroxide of Hydrogen Medicinal	10.95	0.0540	0.44	None
No. 7.	Merck & Co.'s Peroxide of Hydrogen Medicinal	0.50	0.2418	4.57	None
No. 8.	Oakland Chemical Co.'s Peroxide of Hydrogen Medicinal	10.50	0.0382	0.34	0.0017
No. 9.	Peuchot's Peroxide of Hydrogen Medicinal	10.60	0.4674	1.77	0.0018
No. 10.	Powers & Weightman's Peroxide of Hydrogen Medicinal	8.40	0.0830	2.03	None
No. 11.	Pyrozone, 3 per cent	11.20	0.0534	0.76	None
No. 12.	Rosengarten & Sons' Peroxide of Hydrogen Medicinal	5.10	0.1002	0.25	None
No. 13.	Smith, Kline & French Co.'s Peroxide of Hydrogen Medicinal	6.15	0.0880	2.6	None
No. 14.	E. A. Squibb's Peroxide of Hydrogen Medicinal	12.40	1.004	12.04	None

By referring to this table it is easily understood that sample No. 2, "hydro-

zone," is far superior to any other brand which has ever been made, not

only on account of its containing a much larger amount of available oxygen, but also owing to the presence of a small quantity of several essential oils, the respective nature of which could not be determined, very likely because they have been submitted to the oxidizing action of peroxide of hydrogen before being used to make "hydrozone."

I attribute to this small quantity of essential oils the great superiority of hydrozone over any other brands of H₂ O₂ as a healing agent.

When hydrozone is diluted with distilled water, in the proportion of half and half, the resulting mixture contains about 13.5 volumes of available oxygen, and its bactericide power still remains the same as the bactericide power of sample No. 5, which contains 16.55 volumes of available oxygen.

Sample No. 14 comes next to sample No. 5, but it is readily seen that the degree of acidity is entirely too large for a preparation which is to be applied to the most sensitive diseased mucous membranes.

Sample No. 11, called "Pyrozone" which contains 11.20 volumes of available oxygen, is quite similar to sample No. 6, with the exception that the latter contains a small quantity of salicylic acid. Very likely the salicylic acid has for its object to increase the bactericide power, but, unfortunately, I fear that it impairs the keeping properties of this preparation.

Acidity.—The 14 brands which I have examined contain free acids (phosphoric, sulphuric, muriatic); and I must say that peroxide of hydrogen medicinal should never be made neutral before using, even in the most delicate cases. Neutral peroxide of hydrogen rapidly decomposes under all conditions of exposure.

The keeping properties of H₂ O₂ solutions vary a great deal with the degree of purity and the percentage of free acids contained therein.

If the proportion of acid is too large, the profession well know that it acts as an irritant upon diseased surfaces. If it is too small, the solution don't keep well.

My opinion is, that a standard solution of medicinal H₂ O₂ must answer the following tests:

1. It should contain at least 15 volumes of available oxygen.

2. The quantity of free acids contained in 100 cubic centimetres should require not less than 1 c. c. and not more than 3 c. c. of normal volumetric soda solution, to be made neutral. Such a small quantity of free acid is not objectionable.

3. It should not contain any soluble baryta salts.

4. It must be free from sediment.

It is to be noticed that the brands No. 7 and No. 12 are valueless.

The brands No. 8 and No. 9 are not fit for medicinal uses, owing to the fact that they contain traces of soluble baryta salts.

The brand No. 3 has a heavy sediment of sulphate of baryta, which may be considered inert towards the system, but it is certainly detrimental to the keeping qualities of this preparation.

Brand No. 14, which is sold as a ten volume solution, is really twelve volumes, but it is too acid. Brand No. 5, which is sold as a fifteen volume solution, is really 16.55 volumes, viz.: About ten per cent. above the standard.

The brand No. 2, which is sold without any mention of volume, is really a 27.35 volume solution, viz.: Ninety per cent. above the standard.

None of the other brands come up to the standard, but on the contrary they run from 35 to 55 per cent. below.

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